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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004900699 for a patent by STEVEN KENESSEY as filed on 12 February 2004.

COMMONWEALTH OF AUSTRALIA
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WITNESS my hand this
Sixth day of August 2004

J. Billingsley

JULIE BILLINGSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES

AUSTRALIA
Patents Act 1990

SPECIFICATION
APPLICATION for a Provisional Patent

Plasma Glazing

The following statement is a full description of this invention, including the best method of performing it known to me:

PLASMA GLAZING

Solving the problem of global warming is know among the scientific community as well as the community at large one of the major challenges of our time. The use of solar energy to lessen the need for greenhouse gas producing methods of electricity generation is one aspect that is contributing to the solving of this problem.

These problems are addressed by the present invention, which provides a novel method of utilizing solar radiation to capture the sun's heat, promote organic life for the production of energy, transport energy and filter and regulate the amount of solar energy entering man made structures.

This invention relates to the provision of devices for the transforming of electromagnetic radiation (specifically from the sun) to heat a liquid or gas within a cavity between two or more layers of glass or other preferably transparent or semi opaque material, which may then be transported to other devices, which may extract the same heat and use it for useful purposes or store the liquid for later use.

In one aspect, the present invention relates to a method and apparatus for exposing microscopic organisms, such as algae, to solar radiation within a liquid such as water, which is preferably maintained at an appropriate temperature for the growth and reproduction of said microscopic organisms, which may preferably be used in other processes in related and connected systems, for example, the decomposition of organic matter and the production of methane gas.

In another aspect, the present invention relates to a method and apparatus for regulating the amount and type of solar radiation that enters a building or other structure.

In another aspect, the present invention relates to a method and apparatus for creating or augmenting the movement of fluid or gas within one or more cavities encased by glass or other preferably transparent or semi opaque material, using thermal syphoning, and/or capillary action and/or mechanical pumping, which may preferably be used to transport the same liquid or gas to other connected systems in order to make use of the energy and/or the organic matter contained within the said liquid or gas.

In another form of the invention and applicable to all of the forms of the invention, the plasma glazing may also be formed with one or more air passages that utilizes the thermal energy that is not collected by the said fluid or gas within the said cavity in order create the movement of air in a building or the like preferably to distribute heat within an architectural space when the external temperature is below a comfortable range and preferably the same air passage may be used to ventilate air within an architectural space when appropriate.

Description of Preferred Embodiments

To assist with the understanding of the invention, reference will now be made to the accompanying drawings, which show examples of the invention. The said examples are of a preferred but non-limiting embodiment. The drawings are described with notes on the drawings.

It will be realized that the plasma glazing according to this invention is not restricted to the forms illustrated.

The present invention has been described in this document with reference to particular embodiments only. It will be understood by persons skilled in the art, that numerous variations and modifications can be made to the invention. All such variations and modifications should be considered to be within the scope of the invention, broadly described within this document.

The claims defining the invention are as follows:

1. A solar radiation collector designed to expose a carrier medium such as liquid or gas to solar radiation within one or more cavities between or enveloped by two or more layers of glass or other preferably transparent or semi opaque material, the said liquid or gas is thus heated or otherwise transformed due to its exposure to said solar radiation and may then be circulated or transported to other devices via pipes or ducts or the like, which may extract the same heat and use it for useful purposes or store the liquid for later use; the said solar radiation collector should preferably be useable as an architectural element such as a window pane or transparent roofing, thus allowing for the transmission of light into an architectural interior after it has completed its task of extracting appropriate energy from the solar radiation passing through it. The same solar radiation collector should also preferably collect heat and radiation reflected out of the same interior. The said solar collector therefore is preferably multi functional and may therefore be used as a fenestration member as well as a energy collector and preferably appear as a transparent glazing member, or as a patterned or textured or semi-opaque fenestration or cladding member within a building or other structure.

2. A solar radiation collector of claim 1 that comprises a method and apparatus for exposing microscopic organisms, such as algae, bacteria or plankton to solar radiation within said carrier medium (such as water), which is heated to an appropriate temperature for the growth and reproduction of said microscopic organisms, which may preferably may be used in other processes in related and connected systems, which for example may be the decomposition of organic matter and the production of methane gas, or the production of oxygen and hydrogen via a photosynthetic type chemical reaction within and outside of the said solar radiation collector. The said appropriate temperature may be regulated by the rate at which the said liquid or gas it circulated or pumped through the system.

3. A solar radiation collector of claim 1 that comprises a method and apparatus for regulating the amount and type of solar radiation that enters a building or other structure through the application of coating materials onto the glass or other preferably transparent or semi opaque members of the said solar radiation collector, which allows appropriate wavelengths of light through (such as those within the visible light spectrum) and absorbs heat and other energy that is not wanted to pass though into the inside and instead traps and transfers the same energy to the carrier medium (said liquid or gas).

4. A solar radiation collector of claim 1 that comprises a method and apparatus for creating or augmenting the movement of fluid or gas within one or more cavities ericased by glass or other preferably transparent or semi opaque material, using thermal syphoning, and/or capillary action and/or mechanical pumping, which may preferably be used to circulate or transport the same liquid or gas to other connected systems in order to make use of the energy and/or the organic matter contained within the said liquid or gas.

5. A solar radiation collector of claim 1 that comprises one or more air passages and/or cavities that utilizes the thermal energy that is not collected by the said fluid or gas within the said cavity to heat the air in the said passage in order create the movement of air in a building or the like preferably to distribute heat within an architectural space when the external temperature is below a comfortable range and preferably the same air passage may be used to ventilate

air within an architectural space when appropriate with the use of vents flaps and the like. The same air heated in the said passage may also be distributed around an architectural space with the use mechanical systems such as fans and ducts and the like.

6. A solar radiation collector of claim 1 that comprises a method and apparatus for hydrogen production utilizing either natural photosynthetic organisms, or biomimetic/artificial photosynthetic systems including those that utilise nanostructures to separate the catalytic functions of water oxidation and hydrogen production.

7. A solar radiation collector designed to expose a carrier medium such as water or a water based synthetic complex to solar radiation within one or more cavities between or enveloped by two or more layers of glass or other preferably transparent or semi opaque material, the said water preferably contains man-made compounds able to harvest solar energy and to use it to produce hydrogen from water through a process of artificial photosynthesis. This said artificial photosynthesis for hydrogen production from sunlight and water by direct photochemistry in synthetic complexes preferably should produce hydrogen (or other fuels) from solar energy and water. The heat or trapped in the said water, due to its exposure to said solar radiation, may then be circulated or transported to other devices via pipes or ducts or the like, which may extract the same heat and use it for useful purposes or store the liquid for later use; the said solar radiation collector should preferably be useable as an architectural element such as a window pane or transparent roofing member, balustrade or the like thus allowing for the transmission of light into an architectural interior or space after it has completed its task of utilizing the appropriate energy from the solar radiation passing through it. The hydrogen or other useful substance produced via this said process of photosynthesis should preferably be captured by the said solar radiation collector and piped away for use or storage or may also be captured whilst the said carrier medium is being circulated or stored.

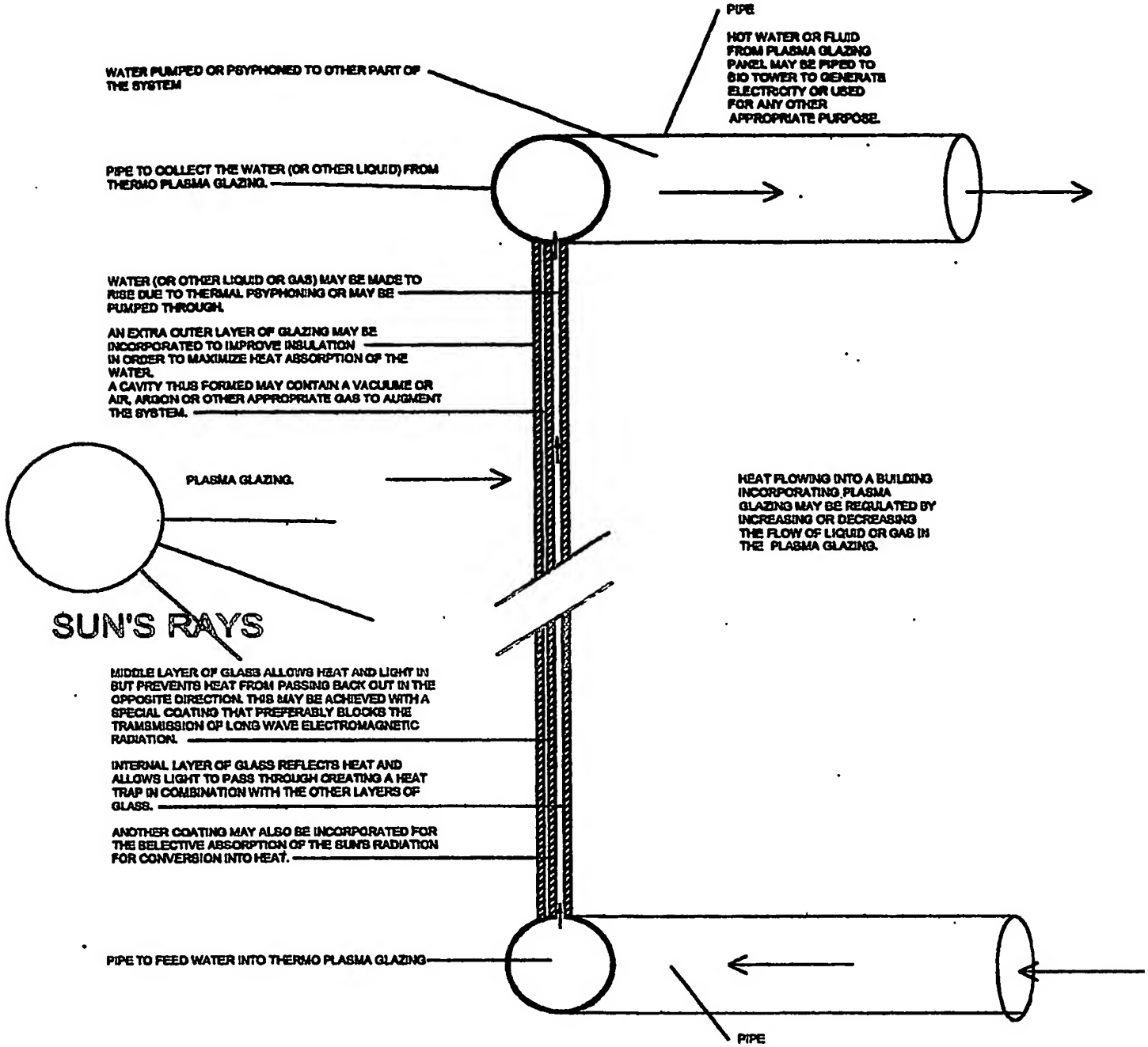
8. A solar radiation collector of claim 7 which exposes microbes such as bacteria to solar radiation within said carrier medium (such as water), which is heated to an appropriate temperature for the growth and reproduction of said microscopic organisms

9. A solar radiation collector of claim 7 for the production of oxygen and hydrogen via a photosynthetic type chemical reaction whereby the appropriate temperature may be regulated by the rate at which the said carrier medium is circulated or pumped through the system.

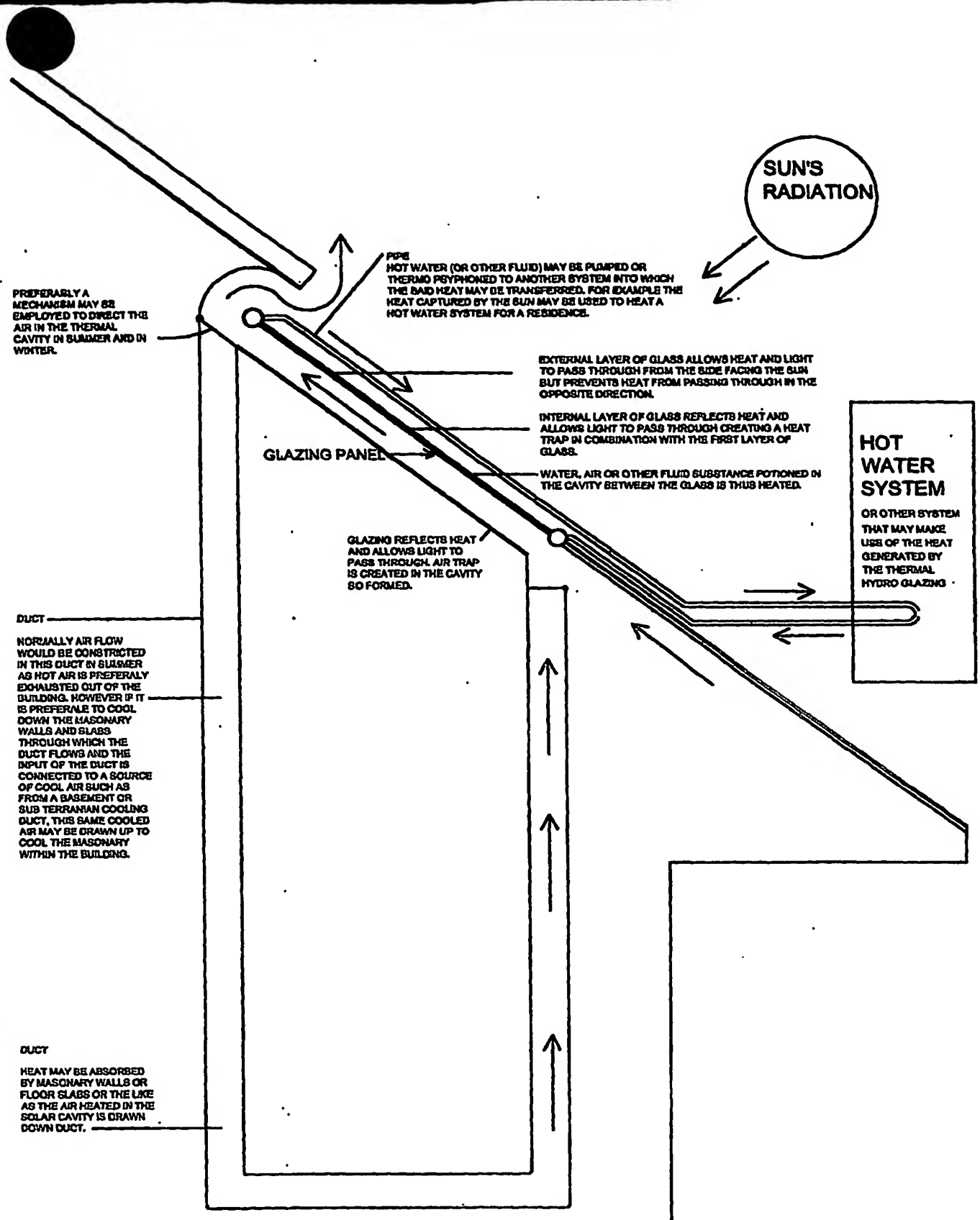
10. A solar radiation collector, substantially as herein described with reference to the accompanying drawings.

The invention relates to the provision of glazing panels or units that may used to collect solar energy and heat a liquid or gas contained within the same glazing panel and circulate that same liquid or gas for use elsewhere; (herein referred to as plasma glazing). These said glazing panels or units may preferably be incorporated into architectural applications for use in applications such as roofing members for awnings and covered pedestrian walkways, glazed fenestration units in buildings and glazed roofs in buildings etc. Preferably the gas or liquid contained within the said plasma glazing is transparent and allows the transmission of light through it in such a way that it appears as a normal glass panel in a window.

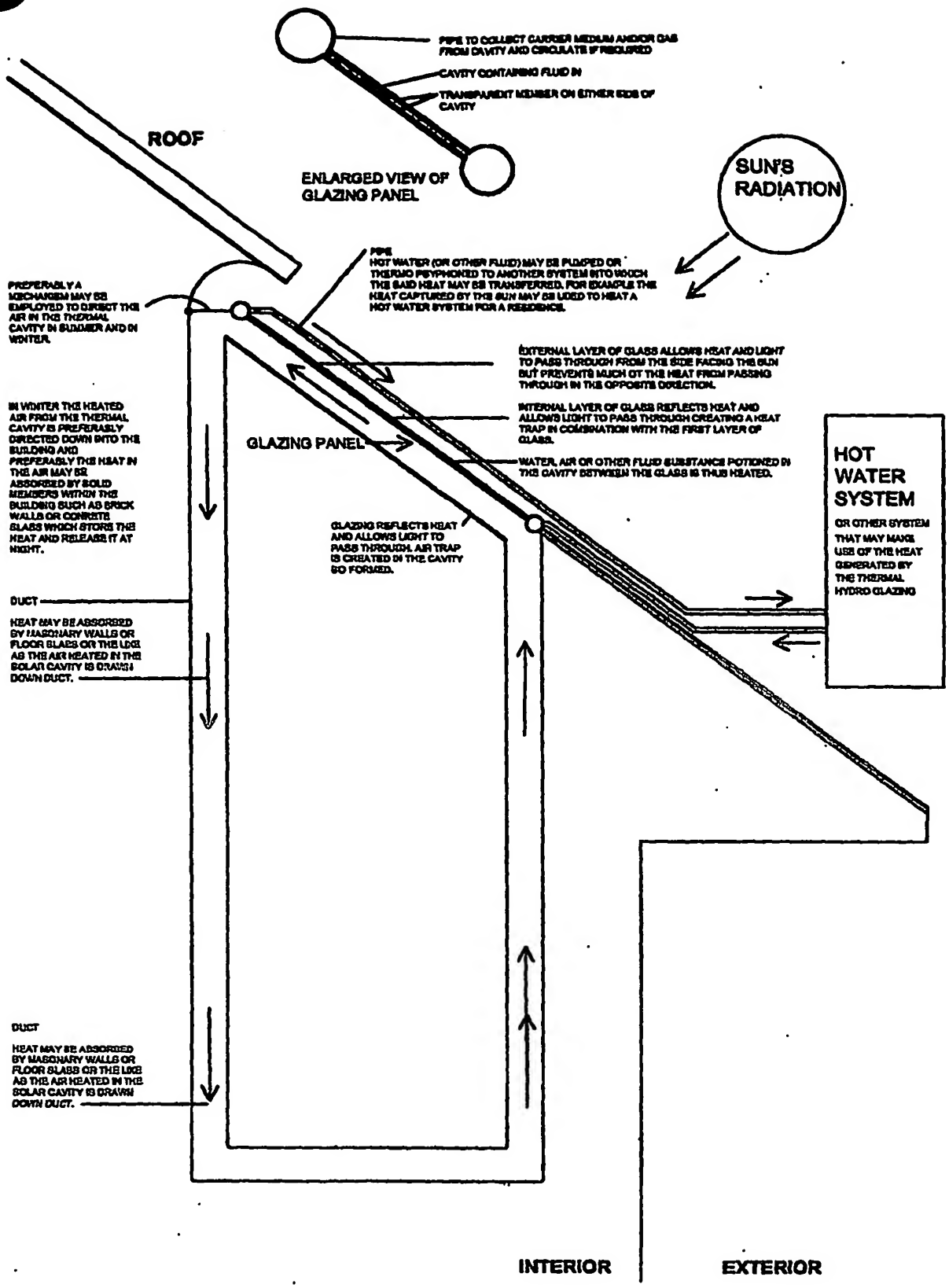
The second aspect relates to the integration of the said plasma glazing member with an air cavity that may be used to provide air movement within a building or other structure.



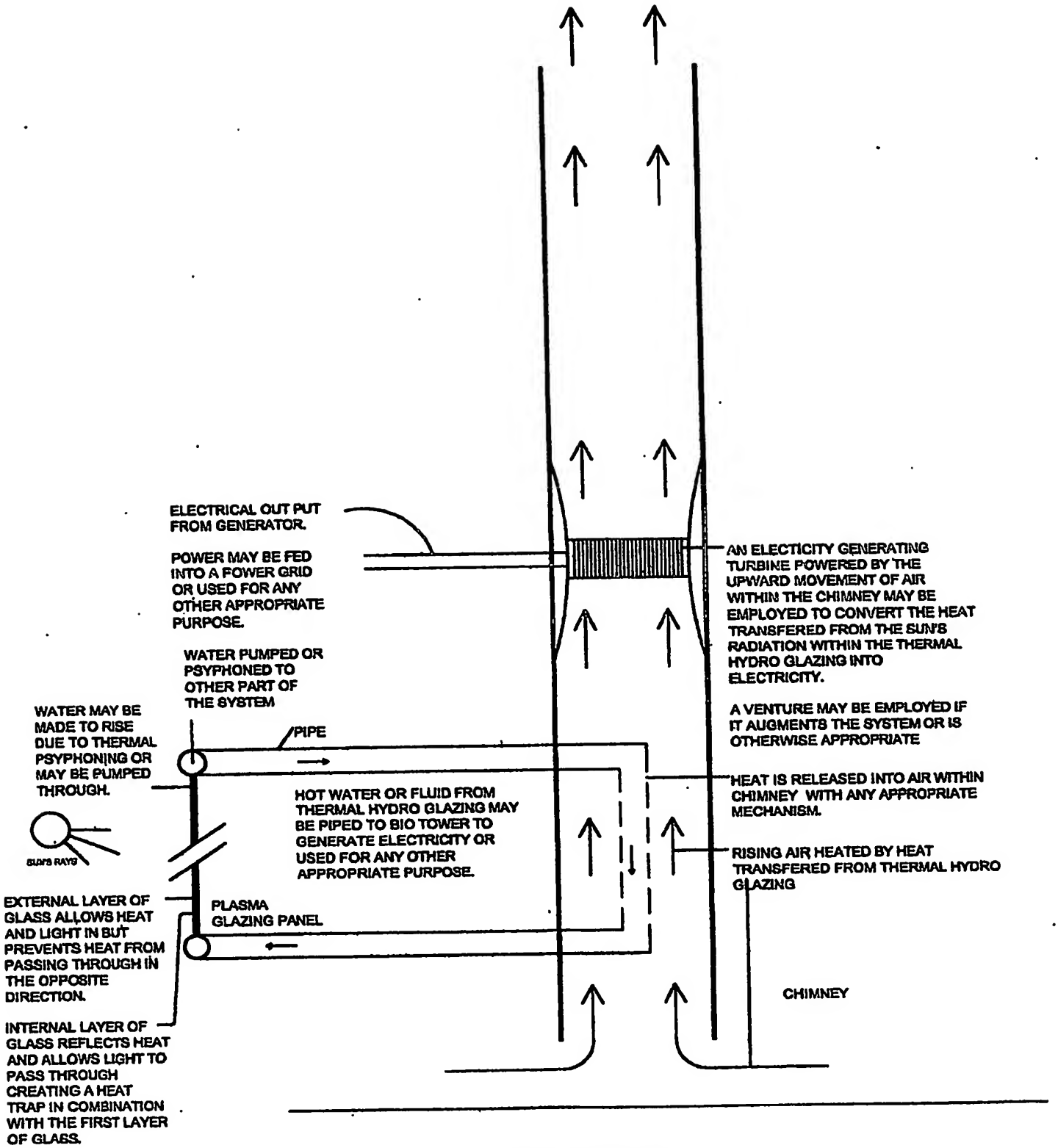
PLASMA GLAZING WITH VACUUME CAVITY



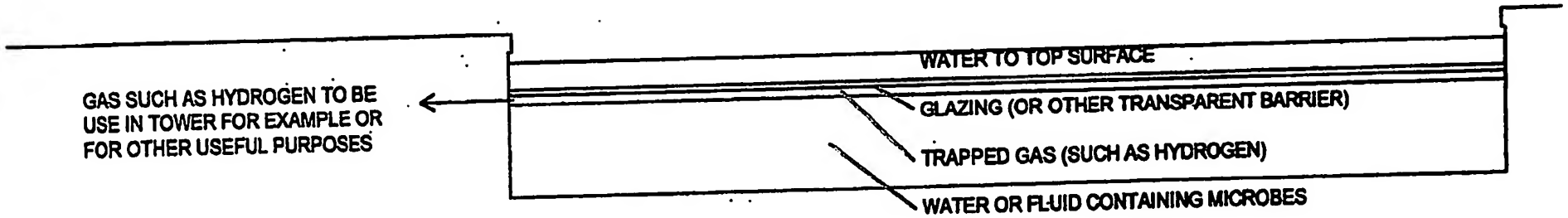
THERMAL HYDRO GLAZING + CAVITY SUMMER MODE



THERMAL HYDRO GLAZING + CAVITY WINTER MODE


ELECTRICAL OUT PUT FROM GENERATOR.
POWER MAY BE FED INTO A POWER GRID OR USED FOR ANY OTHER APPROPRIATE PURPOSE.
WATER PUMPED OR PSYPHONED TO OTHER PART OF THE SYSTEM
WATER MAY BE MADE TO RISE DUE TO THERMAL PSYPHONING OR MAY BE PUMPED THROUGH.
PIPE
SUN'S RAYS
HOT WATER OR FLUID FROM THERMAL HYDRO GLAZING MAY BE PIPED TO BIO TOWER TO GENERATE ELECTRICITY OR USED FOR ANY OTHER APPROPRIATE PURPOSE.
EXTERNAL LAYER OF GLASS ALLOWS HEAT AND LIGHT IN BUT PREVENTS HEAT FROM PASSING THROUGH IN THE OPPOSITE DIRECTION.
PLASMA GLAZING PANEL
INTERNAL LAYER OF GLASS REFLECTS HEAT AND ALLOWS LIGHT TO PASS THROUGH CREATING A HEAT TRAP IN COMBINATION WITH THE FIRST LAYER OF GLASS.
AN ELECTICITY GENERATING TURBINE POWERED BY THE UPWARD MOVEMENT OF AIR WITHIN THE CHIMNEY MAY BE EMPLOYED TO CONVERT THE HEAT TRANSFERED FROM THE SUN'S RADIATION WITHIN THE THERMAL HYDRO GLAZING INTO ELECTRICITY.
A VENTURE MAY BE EMPLOYED IF IT AUGMENTS THE SYSTEM OR IS OTHERWISE APPROPRIATE
HEAT IS RELEASED INTO AIR WITHIN CHIMNEY WITH ANY APPROPRIATE MECHANISM.
RISING AIR HEATED BY HEAT TRANSFERED FROM THERMAL HYDRO GLAZING
CHIMNEY

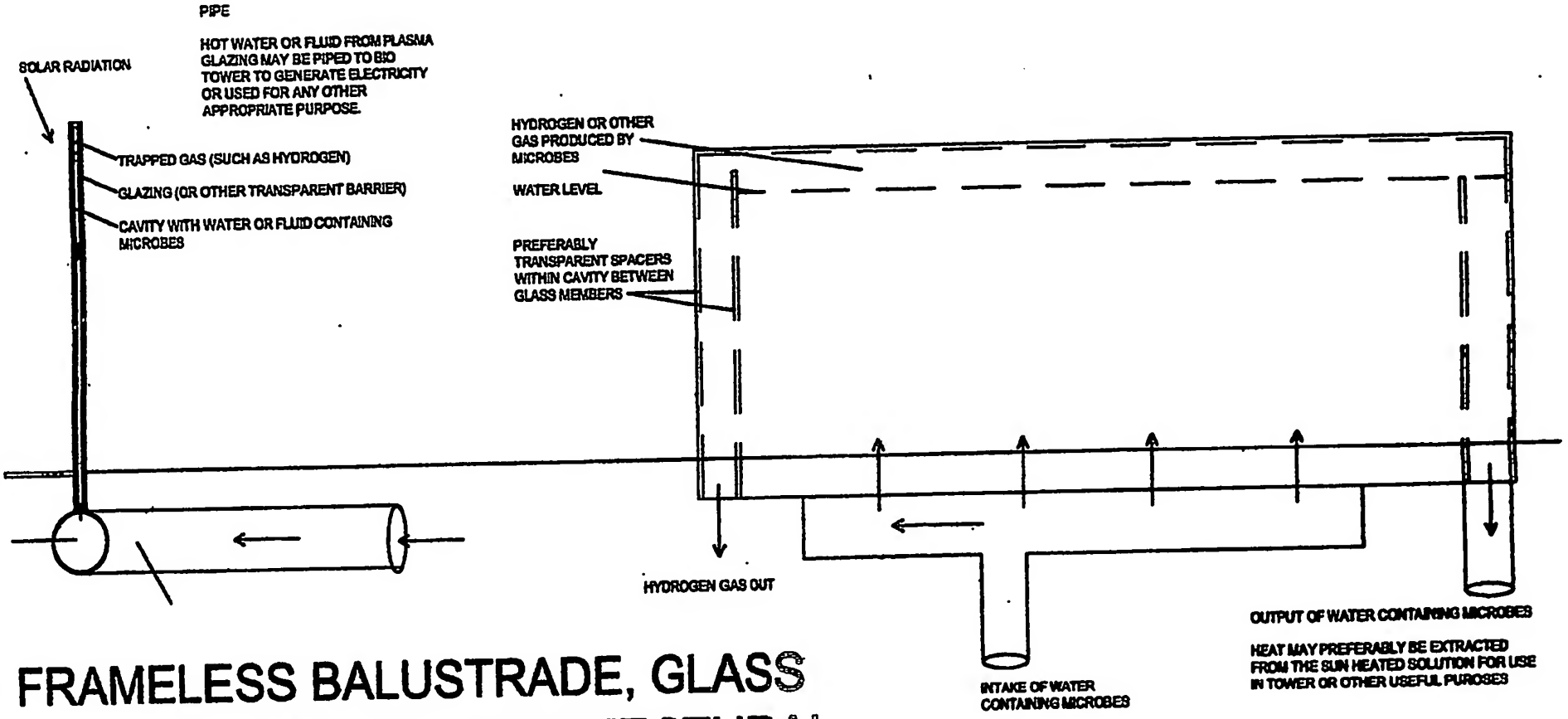
BIO TOWER



A solar radiation collector designed to expose a carrier medium such as water or a water based synthetic complex to solar radiation within one or more cavities between or covered by one or more layers of glass or other preferably transparent or semi opaque material, the said water preferably contains man-made compounds able to harvest solar energy and to use it to produce hydrogen from water through a process of artificial photosynthesis. This said artificial photosynthesis for hydrogen production from sunlight and water by direct photochemistry in synthetic complexes preferably should produce hydrogen (or other fuels) from solar energy and water. The heat or trapped in the said water, due to its exposure to said solar radiation, may then be circulated or transported to other devices via pipes or ducts or the like, which may extract the same heat and use it for useful purposes or store the liquid for later use; the said solar radiation collector should preferably be useable as an architectural element such as a pond or water feature, balustrade. The hydrogen or other useful substance produced via this said process of photosynthesis should preferably be captured by the said solar radiation collector and piped away for use or storage or may also be captured whilst the said carrier medium is being circulated or stored.

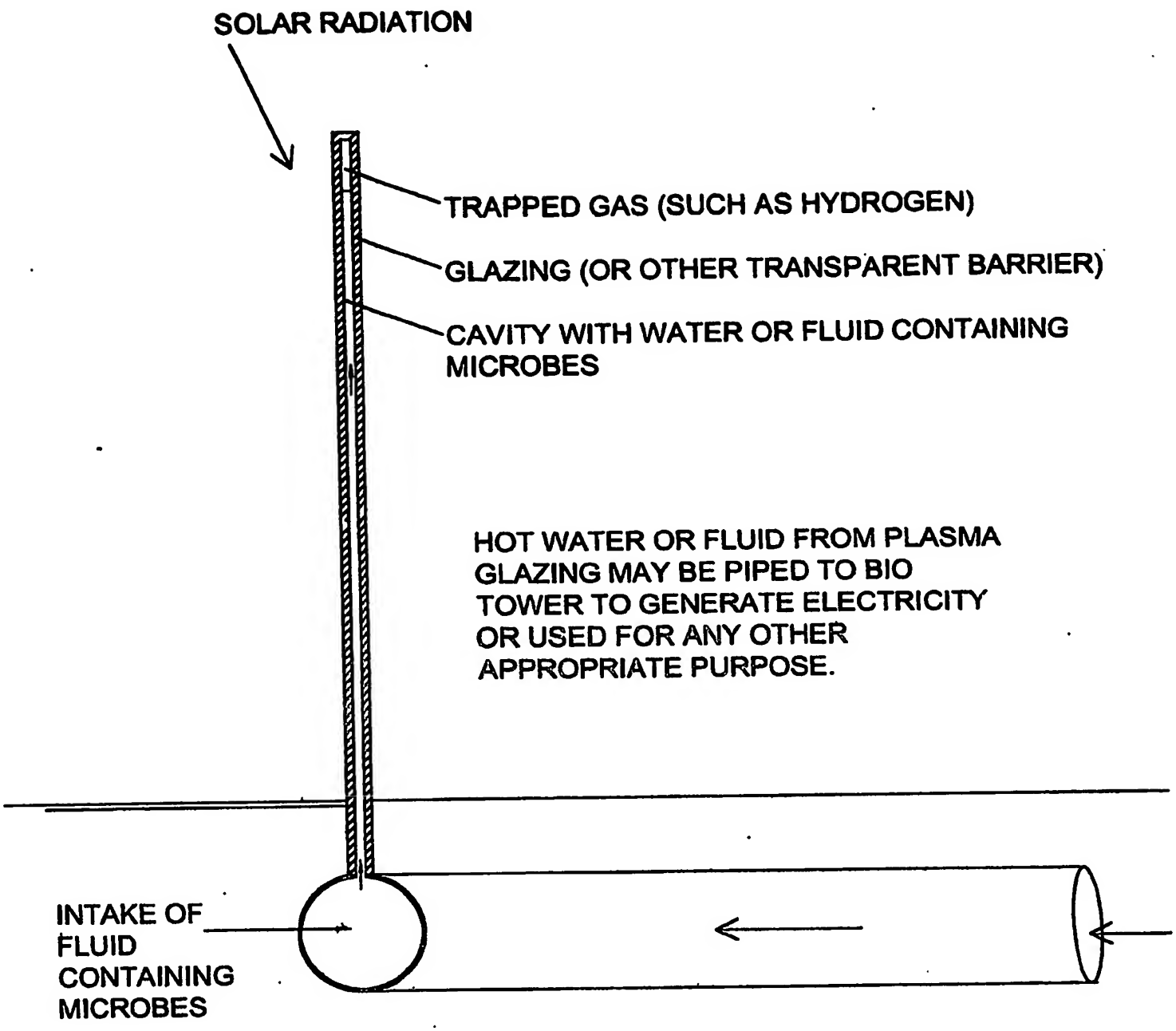
REFLECTION POOL SOLAR COLLECTOR

A MEANS TO USE AN ARCHITECURAL FEATURE AS A SOLAR COLLECTOR UTILISING MICOBIAL LIFE AS THE PHOTOSYSTNESISING MEDIUM.



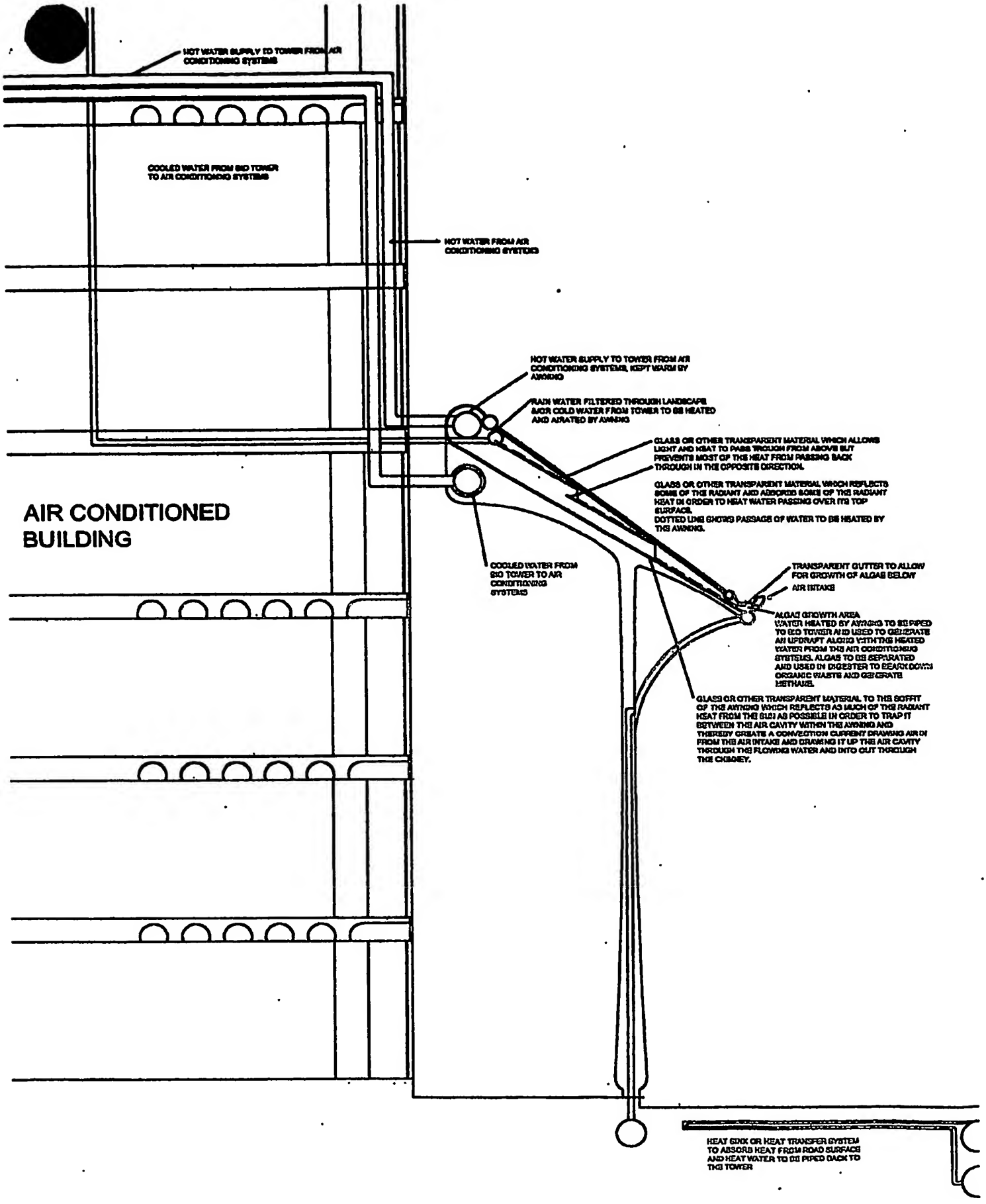
FRAMELESS BALUSTRADE, GLASS PANEL OR OTHER ARCHITECTURAL DEVICE

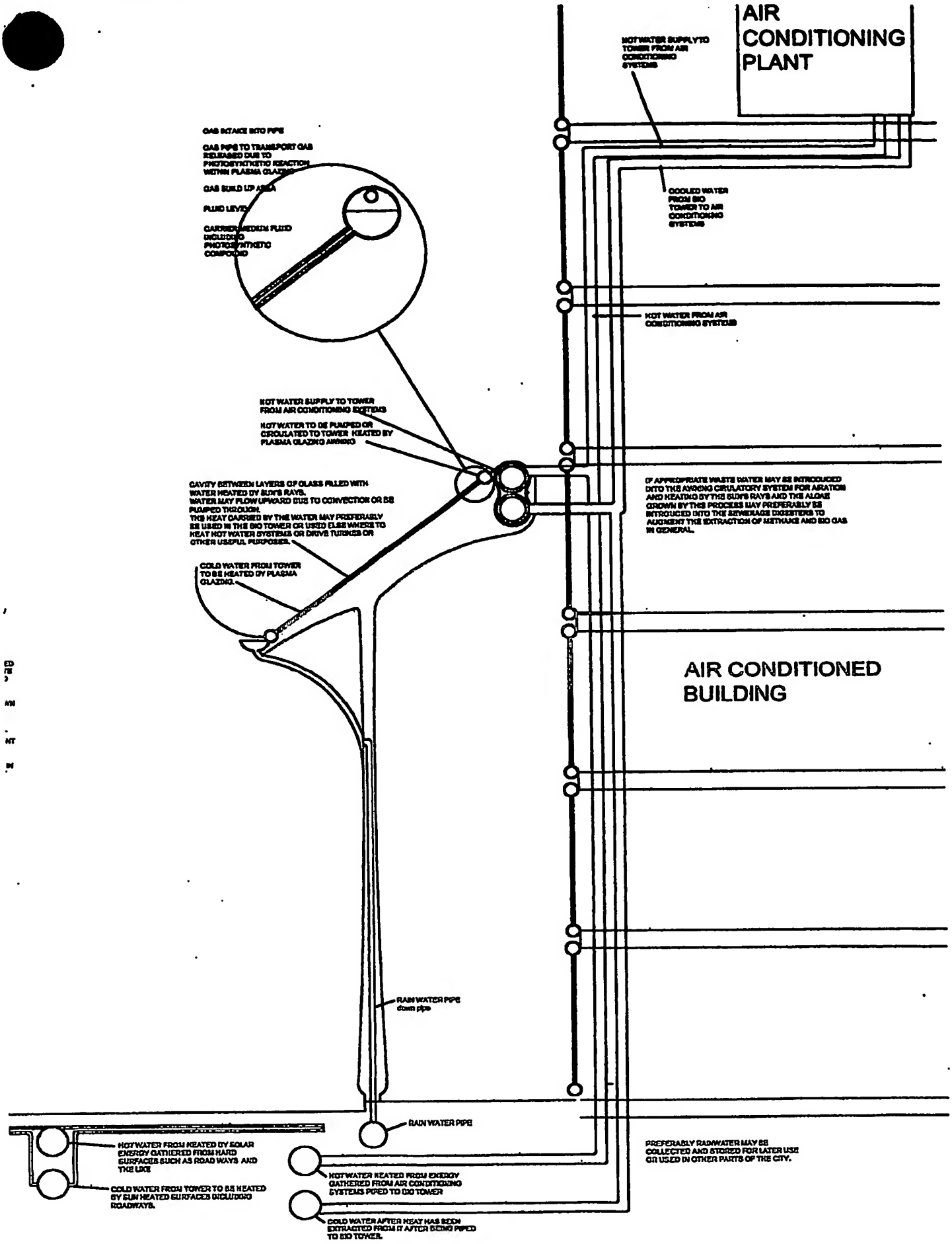
A MEANS TO USE AN ARCHITECURAL FEATURE AS A SOLAR COLLECTOR UTILISING MICOBIAL LIFE AS THE PHOTOSYSTNESISING MEDIUM

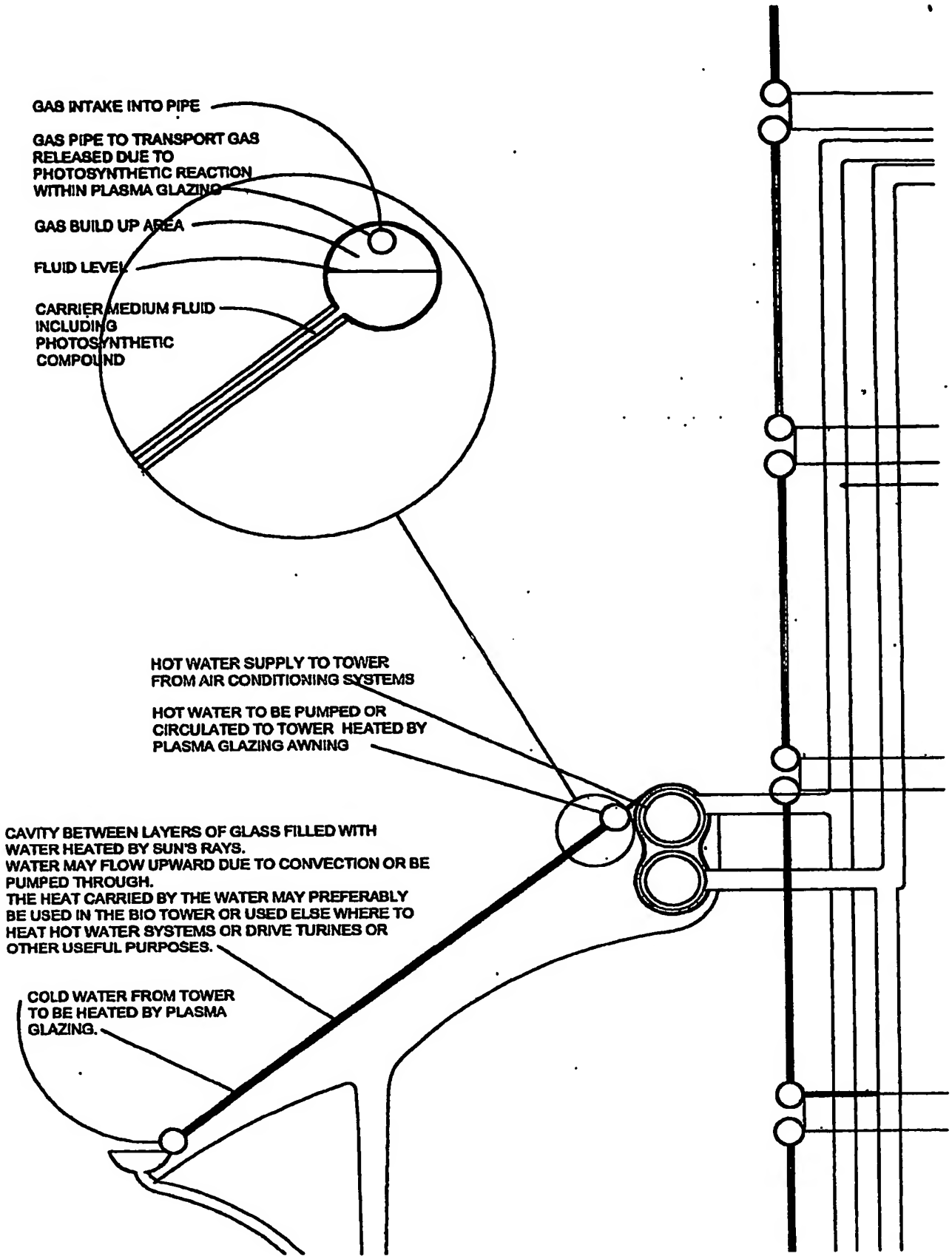


FRAMELESS BALUSTRADE, GLASS PANEL OR OTHER ARCHITECTURAL DEVICE

A MEANS TO USE AN ARCHITECURAL FEATURE AS A SOLAR COLLECTOR UTILISING MICOBIAL LIFE AS THE PHOTOSYSTNESISING MEDIUM.


HOT WATER SUPPLY TO TOWER FROM AIR CONDITIONING SYSTEMS
COOLED WATER FROM BIO TOWER TO AIR CONDITIONING SYSTEMS
HOT WATER FROM AIR CONDITIONING SYSTEMS
HOT WATER SUPPLY TO TOWER FROM AIR CONDITIONING SYSTEMS, KEPT WARM BY AWNING
RAIN WATER FILTERED THROUGH LANDSCAPE AND/OR COLD WATER FROM TOWER TO BE HEATED AND AERATED BY AWNING
GLASS OR OTHER TRANSPARENT MATERIAL WHICH ALLOWS LIGHT AND HEAT TO PASS THROUGH FROM ABOVE BUT PREVENTS MOST OF THE HEAT FROM PASSING BACK THROUGH IN THE OPPOSITE DIRECTION.
GLASS OR OTHER TRANSPARENT MATERIAL WHICH REFLECTS SOME OF THE RADIANT AND ABSORBS SOME OF THE RADIANT HEAT IN ORDER TO HEAT WATER PASSING OVER ITS TOP SURFACE.
DOTTED LINE SHOWS PASSAGE OF WATER TO BE HEATED BY THE AWNING.
AIR CONDITIONED BUILDING
COOLED WATER FROM BIO TOWER TO AIR CONDITIONING SYSTEMS
TRANSPARENT GUTTER TO ALLOW FOR GROWTH OF ALGAE BELOW
AIR INTAKE
ALGAE GROWTH AREA
WATER HEATED BY AWNING TO BE PIPED TO BIO TOWER AND USED TO GENERATE AN UPDRAFT ALONG WITH THE HEATED WATER FROM THE AIR CONDITIONING SYSTEMS. ALGAE TO BE SEPARATED AND USED IN DIGESTER TO BREAK DOWN ORGANIC WASTE AND GENERATE METHANE.
GLASS OR OTHER TRANSPARENT MATERIAL TO THE SOFFIT OF THE AWNING WHICH REFLECTS AS MUCH OF THE RADIANT HEAT FROM THE SUN AS POSSIBLE IN ORDER TO TRAP IT BETWEEN THE AIR CAVITY WITHIN THE AWNING AND THEREBY CREATE A CONVECTION CURRENT DRAWING AIR IN FROM THE AIR INTAKE AND DRAWING IT UP THE AIR CAVITY THROUGH THE FLOWING WATER AND INTO OUT THROUGH THE CHIMNEY.
HEAT SINK OR HEAT TRANSFER SYSTEM TO ABSORB HEAT FROM ROAD SURFACE AND HEAT WATER TO BE PIPED BACK TO THE TOWER


AIR CONDITIONING PLANT
HOT WATER SUPPLY TO TOWER FROM AIR CONDITIONING SYSTEMS
GAS INTAKE INTO PIPE
GAS PIPE TO TRANSPORT GAS RELEASED DUE TO PHOTOSYNTHETIC REACTION WITHIN PLASMA GLAZING
GAS BUILD UP AREA
FLUID LEVEL
CARRIER MEDIUM FLUID INCLUDING PHOTOSYNTHETIC COMPOUND
COOLED WATER FROM BIO TOWER TO AIR CONDITIONING SYSTEMS
HOT WATER FROM AIR CONDITIONING SYSTEMS
HOT WATER SUPPLY TO TOWER FROM AIR CONDITIONING SYSTEMS
HOT WATER TO BE PUMPED OR CIRCULATED TO TOWER HEATED BY PLASMA GLAZING ARRAYS
CAVITY BETWEEN LAYERS OF GLASS FILLED WITH WATER HEATED BY SUN'S RAYS. WATER MAY FLOW UPWARD DUE TO CONVECTION OR BE PUMPED THROUGH. THE HEAT CARRIED BY THE WATER MAY PREFERABLY BE USED IN THE BIO TOWER OR USED ELSEWHERE TO HEAT HOT WATER SYSTEMS OR DRIVE TURBINES OR OTHER USEFUL PURPOSES.
IF APPROPRIATE WASTE WATER MAY BE INTRODUCED INTO THE AIRCON CIRCULATORY SYSTEM FOR AERATION AND HEATING BY THE SUN'S RAYS AND THE ALGAE GROWN BY THIS PROCESS MAY PREFERABLY BE INTRODUCED INTO THE SEWERAGE DIGESTERS TO AUGMENT THE EXTRACTION OF METHANE AND BIO GAS IN GENERAL.
COLD WATER FROM TOWER TO BE HEATED BY PLASMA GLAZING.
AIR CONDITIONED BUILDING
RAIN WATER PIPE down pipe
RAIN WATER PIPE
HOT WATER FROM HEATED BY SOLAR ENERGY GATHERED FROM HARD SURFACES SUCH AS ROAD WAYS AND THE LIKE
COLD WATER FROM TOWER TO BE HEATED BY SUN HEATED SURFACES INCLUDING ROADWAYS.
HOT WATER HEATED FROM ENERGY GATHERED FROM AIR CONDITIONING SYSTEMS PIPED TO BIO TOWER
COLD WATER AFTER HEAT HAS BEEN EXTRACTED FROM IT AFTER BEING PIPED TO BIO TOWER.
PREFERABLY RAINWATER MAY BE COLLECTED AND STORED FOR LATER USE OR USED IN OTHER PARTS OF THE CITY.


GAS INTAKE INTO PIPE
GAS PIPE TO TRANSPORT GAS RELEASED DUE TO PHOTOSYNTHETIC REACTION WITHIN PLASMA GLAZING
GAS BUILD UP AREA
FLUID LEVEL
CARRIER MEDIUM FLUID INCLUDING PHOTOSYNTHETIC COMPOUND
HOT WATER SUPPLY TO TOWER FROM AIR CONDITIONING SYSTEMS
HOT WATER TO BE PUMPED OR CIRCULATED TO TOWER HEATED BY PLASMA GLAZING AWNING
CAVITY BETWEEN LAYERS OF GLASS FILLED WITH WATER HEATED BY SUN'S RAYS.
WATER MAY FLOW UPWARD DUE TO CONVECTION OR BE PUMPED THROUGH.
THE HEAT CARRIED BY THE WATER MAY PREFERABLY BE USED IN THE BIO TOWER OR USED ELSE WHERE TO HEAT HOT WATER SYSTEMS OR DRIVE TURINES OR OTHER USEFUL PURPOSES.
COLD WATER FROM TOWER TO BE HEATED BY PLASMA GLAZING.